

REMARKS

Claims 1-28 are pending in the present application with claims 1-28 amended.
Reexamination and reconsideration of the claims are respectfully requested.

Applicant has amended the specification to correct a number of grammatical and typographical errors as well as other minor errors. No new matter has been added.

Applicant has amended the title and the corresponding Field of Invention section to more clearly describe the invention.

The Examiner rejected claims 1-28 under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is mostly connected, to make and/or use the invention. The Examiner further rejected claims 1-28 under 35 U.S.C. § 102(b) as being met by Japanese patent documents 10319952 (JP '952), 10319953 (JP '953) and 10319954 (JP '954). The Examiner also rejected claims 1-28 under 35 U.S.C. § 102(b) as being met by Shibukawa (U.S. Patent No. 4,992,794), Woron et al. (U.S. Patent No. 4,147,083), Franz et al. (U.S. Patent No. 4,250,788) or Yuzawa et al. (U.S. Reissue No. 33,607). Support for Applicants' argument is detailed below.

The present invention is directed generally to extension boards which are installed in musical tone generation apparatuses for expansion of tone colors and effects. The musical tone generation apparatus of this invention is basically configured by a main sound source device installing an extension board (see fig. 1).

When the extension board is installed in the main sound source device, function setting data regarding new functions installed on the extension board are automatically transferred to the main sound source device so that a user is capable of adequately setting and controlling the new functions by using operators configured on the main sound source device. If the extension board corresponds to a tone color extension board that provides extended tone colors which differ from preset tone colors installed in the main sound source device in advance, the main

sound source device is capable of generating musical tones using the extended tone colors. In that case, it is possible for the sequencer to enable reproduction of a specific sound pattern such as an arpeggio and a phrase to be suited to the extended tone color or colors. If the extension board corresponds to an extended effect board that provides extended effects such as harmony, reverb, chorus and echo, the main sound source device is capable of adequately imparting them to musical tones or other sounds.

In rejecting claims 1-28 under § 112, first paragraph, the Examiner inquired about the structural and electrical cooperation between the extension board and the remaining features of the invention. With respect to the structural cooperation, extension cards are well known in the art and a person of ordinary skill in the art would certainly know how to structurally connect an extension board to the main sound source device.

As for the electrical cooperation between the extension board and the main sound source device, the specification does disclose such cooperation to enable one skilled in the art to make and use the present invention. Fig. 1 displays an I/O interface 24 that provides an interconnection between the main sound source device and the tone color extension board. The board, in turn, has an I/O interface 31 connected to the I/O interface 24. The specification at page 8, lines 17-24, further discloses the type of information and data that are transferred via the I/O interface 31 from the main sound source device to the extension board and vice versa. Such disclosure is sufficient to meet the enablement requirement.

The Examiner rejected claims 1-28 under 35 U.S.C. § 102(b) as being anticipated by JP '952, JP '953 and JP '954. In each of these references, a mother board of an electronic musical instrument has some connectors which are detachably connected with a plug-in board or extension board. Specifically, JP '952 discloses a first sound source (108) and a second sound source from a plug-in board. Information and parameters are selectively input to the electronic musical instrument by the operator panel and are supplied from the mother board to the plug-in board via the connector. This enables the user to manually set up various conditions for the

plug-in board via the operator panel of the electronic musical instrument. JP '953 focuses on the prevention of any overlap generation of sounds in the mother board and the plug-in boards while JP '952 discloses a musical sound generating algorithm setting device regarding the plug-in boards.

None of these references, however, disclose a particular feature of the present invention in which prescribed elements of musical tones are expanded and used to execute new functions on the extension board, which differ from the original functions of the musical tone generation apparatus. In addition, these references also fail to disclose sequencers which are installed in the extension boards for reproduction of sound patterns and arpeggio patterns. Accordingly, the present inventions is not anticipated by JP '952, '953 and '954.

With this reply, Applicant has concurrently submitted an information disclosure statement disclosing Hiramatsu (U.S. Patent No. 6,069,311). Hiramatsu claims priority to three Japanese patent applications -- 9-132656, 9-132658 and 9-132659 -- which respectively correspond to JP '952, '953 and '954. For the reasons set forth above, Hiramatsu also does not anticipate the present invention.

None of the remaining references -- Shibukawa, Woron et al., Franz et al. and Yuzawa et al. -- cited by the Examiner anticipates the present invention. Shibukawa discloses an electronic musical instrument that is connectable with an external memory device such as the RAM pack, RAM book or magnetic tape, characterized by controlling information transfer between an internal memory device of the electronic musical instrument and external memory device of the highest priority, which is determined by comparison in storage capacity between the internal memory device and external memory devices. Franz et al. discloses an electronic organ to which cards can be detachably inserted, wherein the programs which are stored in data storages of distributor circuits on one insertable card can be transferred into the storages of distributor circuits on another insertable card. Woron et al. merely discloses that tone color information stored in internal memory of the electronic organ is transferred to the external memory, and

Yuzawa et al. discloses an electronic musical instrument having automatic performance functions, to which the ROM pack or tape recorder can be detachably attached.

In rejecting all the claims under these references, the Examiner stated that the cards, ROM packs or RAM packs in the above references “read on applicant’s tone color extension cards for an electronic musical instrument.” At most, these references merely disclose the use of recording media, which are easily attachable or detachable from an electronic musical instrument, to read and write information, such as tune data and tone color data.

In contrast, the extension board of the present invention is designed to execute new functions which are not originally provided in the apparatus. For example, if an extension board having an FM sound source is installed in the PCM sound source module, it is possible to add musical tone synthesizing functions of the FM method to the PCM sound source module. The recording media or external memory devices of Shibukawa, Woron et al., Franz et al. and Yuzawa et al. are not designed to execute such new functions. Therefore, these references do not anticipate the present invention.

In view of the foregoing, claims 1-28 are patentable over the cited references. Accordingly, Applicant respectfully submits that all of the pending claims in the present application are in condition for allowance. Reexamination and reconsideration of the claims, as amended, are respectfully requested and an early allowance is solicited. If the Examiner feels that it would advance the prosecution of the application, it is respectfully requested that the Examiner telephone the undersigned attorney of record.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned “**Version with markings to show changes made**”.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, Applicants petition for any required relief including extensions of time and authorizes the Assistant Commissioner to

charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. 39303.20148.00. However, the Assistant Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

MUSICAL TONE GENERATION APPARATUS INSTALLING [AND] EXTENSION BOARD FOR EXPANSION OF TONE COLORS AND EFFECTS [ENHANCING FUNCTIONS THEREOF]

This invention relates to musical tone generation apparatuses that generate musical tones in response to desired tone colors. This invention also relates to extension boards which are installed in the musical tone generation apparatuses for expansion of tones colors and effects [to enhance their functions].

Similar [As similar] to the computer systems, musical tone generation apparatuses such as sound source devices (or tone generators) and electronic musical instruments install tone color extension boards to enable generation of musical tones using extended tone colors, which differ from preset tone colors originally stored therein. Or, they install extended effect boards to add new effect functions.

A musical tone generation apparatus of this invention is basically configured by a main sound source device installing an extension board. Herein, the main sound source device is configured by a CPU, memories, operators, a music synthesizer, a mixer, an effector and a sound system, while the extension board is configured by fabricating a CPU (or sequencer), memories and a music synthesizer (or effector). When the extension board is installed in the main sound source device, function setting data regarding new functions installed on the extension board is automatically transferred to the main sound source device so that a user is capable of adequately setting and controlling the new functions by using the operators. If the extension board corresponds to a tone color extension board that provides extended tone colors which differ from

preset tone colors [being] installed in the main sound source device in advance, the main sound source device is capable of generating musical tones using the extended tone colors. In that case, it is possible for the sequencer to enable reproduction of a specific sound pattern such as an arpeggio and a phrase to be suited to the extended tone color(s). If the extension board corresponds to an extended effect board that provides extended effects such as harmony, reverb, chorus and echo, the main sound source device is capable of adequately imparting them to musical tones or other sounds.

In addition, the main sound source device 1 is connected with an external MIDI device 2 (herein, "MIDI" is an abbreviation for the known standard of "Musical Instrument Digital Interface"). The external MIDI device 2 represents a sequencer, an electronic musical instrument or a personal computer installing a MIDI keyboard or MIDI sequencer software. The main sound source device 1 generates musical tones in response to MIDI signals given from the external MIDI device 2. The tone color extension board 3 installs a music synthesizer (36) enabling generation of tone colors which are not stored in the main sound source device 1. Incidentally, the tone color extension board 3 installs extended tone colors as well as a special tool or measure (not shown, details will be described later) for actualization of new functions which utilize the extended tone colors and which are not stored in the main sound source device 1. As an example of the new functions, the present specification describe [about] a sequencer function that actualizes generation of sound patterns such as arpeggio sounds and melody sounds of phrases.

Reference [A reference] numeral "15" collectively designates [designate] manual operable members such as switches, keys and controls (hereinafter, simply referred to as "operators"). Herein, the operators 15 are used to set the tone colors for generation of musical tones as well as tone color parameters in the main sound source device 1. In addition, they are

used to set tone color parameters and sound patterns for the tone color extension board 3. Basically, the operators 15 are actualized by “physical switches” or “software switches” that operate in cooperation with a display 17 in accordance with software. A detection circuit (or detection circuits) 16 detects operations of the operators 15.

A music synthesizer 20 synthesizes and generates musical tone signals over multiple channels. The music synthesizer 20 is able to employ any type [types] of music synthesis methods such as waveform memory method, frequency modulation (FM) method, physical model method, higher harmonic synthesis method, formant synthesis method and analog synthesizer method (e.g., VCO+VCF+VCA, where “VCO” is an abbreviation for “voltage-controlled oscillator” and “VCA” is an abbreviation for “voltage-controlled amplifier”). In addition, the music synthesizer 20 is not necessarily designed as a hardware music synthesizer that is configured using specially designed hardware. So, it is possible to employ a music synthesizer that is configured using a digital signal processor (i.e., DSP) and its microprogram or a music synthesizer that is configured using a CPU and its software program. In addition, the music synthesizer 20 can be designed to realize multiple tone-generation channels by using a single circuit in a time-division manner, or it can be designed such that a single tone-generation channel is realized by a single circuit.

As described above, the musical tone generation apparatus of the present embodiment is basically designed such that the main sound source device 1 responds to installation of the tone color extension board 3 that stores the function setting data 50 in advance. So, the [the] main sound source device 1 reads the function setting data 50 from the tone color extension board 3 to perform assignment of functions to the prescribed switches of the operators 15. For this reason, the main sound source device 1 is capable of coping with installation of any types of tone color extension boards that install new tone colors and new functions. That is, the main sound source device 1 is capable of performing setting operations with respect to any kinds of new tone colors

and new functions installed on the tone color extension boards by using the operators 15. As compared with other apparatuses and devices, the main sound source device 1 is capable of easily performing setting operations with respect to the new functions accompanied with the extended tone colors installed on the tone color extension board 3.

Lastly, the present embodiment describes the musical tone generation apparatus basically in a form of a hardware system installing an extension board. Of course, this invention is not necessarily limited to such hardware structure but is actualized by software processing. For example, substantially all parts of the musical tone generation apparatus can be actualized on a personal computer or the like [else] in which they are displayed on a screen so that the user operates them with clicks of a mouse or the like [else]. In that case, programs actualizing the parts of the musical tone generation apparatus are provided by storage medium such as floppy disks, compact disks and the like, or they are provided and downloaded from some computer networks such as Internet.

In the Claims:

1. (Amended) A musical tone generation apparatus [which incorporates a processing device,] incorporating a music synthesizer and operators, comprising:
a readout for reading first function setting information from an extension board [being installed, the function setting information being provided with respect to at least one extended function installed on], wherein the extension board provides expansion of prescribed elements of musical tones by which new functions are to be executed in connection with the first setting information;
an incorporator for [incorporating the extended function of the extension board based on the] setting up the new functions based on the first function setting information [such that the extended function is set and controlled by] in response to manual operations applied to the operators; and
a sender for sending [extended-]second function setting information [to] corresponding to the setup to allow the extension board[, wherein the extended-function setting information is related to the extended function of the extension board and is produced in response to operations applied to the operators] to execute the new functions.
2. (Amended) A musical tone generation apparatus according to claim 1 wherein the [extension board corresponds to a tone color extension board that provides at least one extended tone color which differs from tone colors being installed in advance, so that the extended function corresponds to a sequencer function that enables reproduction of a sound pattern using the extended tone color] prescribed elements correspond to tone colors of the musical tones, and the new functions correspond to sequencer functions by which the musical tones are reproduced with expanded tone colors in accordance with sound patterns respectively.

3. (Amended) A musical tone generation apparatus according to claim 1 wherein the [extension board corresponds to a tone color extension board that provides at least one extended tone color which differs from tone colors being installed in advance, so that the extended function corresponds to a sequencer function that enables sequential generation of musical tones of an arpeggio using the extended tone color] prescribed elements correspond to tone colors of the musical tones, and the new functions correspond to sequencer functions by which the musical tones are sequentially reproduced with expanded tone colors in accordance with arpeggio patterns respectively.

4. (Amended) A musical tone generation apparatus according to claim 1 further comprising an I/O interface for interconnection with the extension board, so that the readout reads the first function setting information from the extension board by way of the I/O interface, [while] and the sender sends the [extended-]second function setting information to the extension board by way of the I/O interface.

5. (Amended) A musical tone generation apparatus according to claim 1 wherein the operators are [used for an extended-function setting process regarding the extended function of the extension board and a music-synthesis setting process regarding the music synthesizer] manipulated in a process for setting the new functions with regard to the expansion of the prescribed elements of the musical tones by the extension board.

6. (Amended) A musical tone generation apparatus according to claim 2 wherein the extension board installs a plurality of [extended] expanded tone colors, each of which [has a decision whether to enable] is selectively used for reproduction of the [sound pattern] musical tones in accordance with the sound patterns respectively.

7. (Amended) A musical tone generation apparatus according to claim 3 wherein the extension board installs a plurality of [extended -]expanded tone colors, each of which [has a decision whether to enable sequential generation] is selectively used for reproduction of the musical tones [of] in accordance with the arpeggio patterns respectively.

8. (Amended) A musical tone generation apparatus according to claim 1 wherein the readout automatically reads the first function setting information from the extension board in [response to] a power-on event.

9. (Amended) An extension board [being installed with] installing a first tone generator, comprising:

an [extender for providing an extension of at least one sound factor being installed in] expander for expanding prescribed elements of musical tones being generated by the first tone generator [in advance with regard to musical tones]; and

an executor for executing [an extended function accompanied with the extension of the at least one sound factor of] new functions on the first tone generator with regard to expansion of the prescribed elements of the musical tones.

10. (Amended) An extension board according to claim 9 wherein the [extender] expander corresponds to a second tone generator [that], which provides [an extended] expanded tone [color which differs] colors different from [an] original tone [color being] colors pre- installed in the first tone generator [in advance, while the executor executes reproduction of a sound pattern using the extended tone color provided by], so that the second tone generator generates musical tones with the expanded tone colors by the new functions in accordance with sound patterns respectively.

11. (Amended) An extension board according to claim 9 wherein the [extender] expander corresponds to a second tone generator [that], which provides [an extended] expanded tone [color which differs] colors different from [an] original tone [color being] colors pre- installed in the first tone generator [in advance, while the executor executes reproduction of musical tones of an arpeggio using the extended tone color], so that the second tone generator sequentially generates musical tones with the expanded tone colors by the new functions in accordance with arpeggio patterns respectively.

12. (Amended) An extension board according to claim 10 wherein the [extender] expander provides a plurality of [extended] the expanded tone colors, each of which [has a decision whether to enable] is selectively used for reproduction of the [sound pattern] musical tones in accordance with the sound patterns respectively.

13. (Amended) An extension board according to claim 11 wherein the [extender] expander provides a plurality of [extended] the expanded tone colors, each of which [has a decision whether to enable] is selectively used for sequential reproduction of the musical tones [of] in accordance with the arpeggio patterns respectively.

14. (Amended) An extension board according to claim 9 wherein the [extender] expander corresponds to an effector [that imparts an extended effect], which provides expanded effects being applied to musical tones generated by the first tone generator, [while] and the executor corresponds to a sequencer [enabling sequential generation of extended-effect-imparted musical tones such that the extended-effect-imparted musical tones are sequentially generated at timings which are shifted from]that sequentially generated the musical tones with the expanded effects at timings that are shifted from original timings for generation of the musical tones.

15. (Amended) A musical tone generation system comprising:
a musical tone generation device incorporating a first music synthesizer that synthesizes [and generates] first musical tones [having] with a prescribed tone color in response to key-operation information; and
a tone color extension board [being] installed in the musical tone generation device to provide [an extended tone color corresponding to an extension] expansion of the prescribed tone color,
wherein said tone color extension board comprises
a sequencer for [enabling reproduction of a] reproducing sound [pattern] patterns in response to the key-operation information [which] that is supplied thereto from the musical tone generation device, and
a second music synthesizer that synthesizes [and generates] second musical tones [using the extended tone color based on the sound pattern being reproduced, so that the second musical tones using the extended tone color are supplied to] with expanded tone colors in accordance with the sound patterns respectively, so that the musical tone generation device [in which the second musical tones are mixed together with] produces mixture of the first musical tones [to produce mixed] and the second musical tones.

16. (Amended) A musical tone generation system according to claim 15 wherein the tone color extension board provides a plurality of [extended] the expanded tone colors [that], which differ from original tone colors [originally] pre-installed in the musical tone generation device [in advance, and each of the plurality of extended tone colors has a decision whether to enable] and each of which is selectively used for reproduction of the sound [pattern] patterns respectively.

17. (Amended) A musical tone generation system according to claim 15 further comprising an effector [that imparts an effect to the mixed] for imparting effects to the mixture of the first and second musical tones.

18. (Amended) A musical tone generation system comprising:
a musical tone generation device incorporating a first music synthesizer that synthesizes [and generates] first musical tones [using] with a prescribed tone color in response to key-operation information; and
a tone color extension board [being] installed in the musical tone generation device to provide [an extended tone color corresponding to an extension] expansion of the prescribed tone color,
wherein said tone color extension board comprises
a sequencer for [enabling reproduction of an] reproducing arpeggio [pattern] patterns in response to the key-operation information [which] that is supplied thereto from the musical tone generation device, and
a second music synthesizer for sequentially generating [enabling sequential generation of] second musical tones with expanded tone colors in accordance with the arpeggio patterns respectively [using the extended tone color based on the arpeggio pattern being reproduced], so that [the second musical tones using the extended tone color are supplied to] the musical tone generation device produces mixture of [in which the second musical tones are mixed together with] the first musical tones and the second [to produce mixed] musical tones.

19. (Amended) A musical tone generation system according to claim 18 wherein the tone color extension board provides a plurality of extended tone colors, which [that] differ from original tone colors pre-installed [originally installed] in the musical tone generation device and [in advance, so that] each of which is selectively used for [the plurality of extended tone colors has a decision whether to enable] reproduction of the arpeggio patterns respectively [pattern].

20. (Amended) A musical tone generation system according to claim 18 further comprising an effector for imparting effects to the mixture of the first and second [an effect to the mixed] musical tones.

21. (Amended) A musical tone generation method comprising the steps of:
reading first function setting information from an extension board [being installed in a . musical tone generation device, wherein the function setting information is provided with respect to at least one extended function installed on], wherein the extension board provides expansion of prescribed elements of musical tones by which new functions are to be executed in connection with the first setting information;

[incorporating the extended function of the extension board based on the] setting up the new functions based on the first function setting information [such that the extended function is set and controlled by] in response to manual operations applied to the operators [of the musical tone generation device];

[producing extended-function setting information in response to operations applied to the operators with regard to the extended function;] and

sending the [extended-] second function setting information [to] corresponding to the setup to allow the extension board to execute new functions.

22. (Amended) A function expanding [extending] method comprising the steps of:
installing by an extension board [with] a first tone generator;
expanding prescribed elements of musical tones being generated by [providing an
extension of at least one sound factor being installed in] the first tone generator [in advance with
regard to musical tones]; and
executing new functions on [an extended function accompanied with the extension of the
at least one sound factor of] the first tone generator with regard to expansion of the prescribed
elements of the musical tones.

23. (Amended) A musical tone generation method applicable to a musical tone
generation device installing a tone color extension board to provide expansion of a prescribed
tone color, said musical tone generation method comprising the steps of:

activating a first music synthesizer of the musical tone generation device to synthesize
[and generate] first musical tones with the [having a] prescribed tone color in response to key-
operation information;

reproducing [a] sound patterns [pattern] in response to the key-operation information that
is supplied thereto from the musical tone generation device [on the tone color extension board];

activating a second music synthesizer of the tone color extension board to synthesize [and
generate] second musical tones [using an extended tone color based on the sound pattern being
reproduced] with expanded tone colors in accordance with the sound patterns respectively; and

mixing the first musical tones together with the second musical tones to produce mixed
musical tones.

24. (Amended) A musical tone generation method applicable to a musical tone generation device installing a tone color extension board to provide expansion of a prescribed tone color, said musical tone generation method comprising the steps of:

activating a first music synthesizer of the musical tone generation device to synthesize [and generate] first musical tones with the [using a] prescribed tone color in response to key-operation information;

reproducing [an] arpeggio patterns [pattern] in response to the key-operation information on the tone color extension board;

activating a second music synthesizer of the tone color extension board to sequentially generate second musical tones with expanded tone colors in accordance with [using an extended tone color based on] the arpeggio patterns respectively [pattern being reproduced]; and

mixing the first musical tones together with the second musical tones to produce mixed musical tones.

25. (Amended) A machine-readable media storing programs and data that cause a musical tone generation device installing an extension board to perform a musical tone generation method comprising the steps of:

reading first function setting information from the extension board [with respect to at least one extended function installed on], wherein the extension board provides expansion of prescribed elements of musical tones by which new functions are to be executed in connection with the first setting information;

[incorporating the extended function of the extension board based on the] setting up the new functions based on the first function setting information [such that the extended function is set and controlled by] in response to manual operations applied to the operators [of the musical tone generation device];

[producing extended-function setting information in response to operations applied to the operators with regard to the extended function;] and

sending the [extended-] second function setting information [to] corresponding to the setup to allow the extension board to excute new functions.

26. (Amended) A machine-readable media storing programs and data that cause an extension board installing a first tone generator [installing an extension board] to perform a function expanding [extending] method comprising the steps of:

expanding prescribed elements of musical tones being generated by [providing an extension of at least one sound factor being installed in] the first tone generator [in advance with regard to musical tones]; and

executing new functions on [an extended function accompanied with the extension of the at least one sound factor of] the first tone generator with regard to expansion of the prescribed elements of the musical tones.

27. (Amended) A machine-readable media storing programs and data that cause a musical tone generation device installing a tone color extension board to perform a musical tone generation method comprising the steps of:

activating a first music synthesizer of the musical tone generation device to synthesize [and generate] first musical tones with [having] a prescribed tone color in response to key-operation information;

reproducing [a] sound patterns [pattern] in response to the key-operation information that is supplied thereto from the musical tone generation device [on the tone color extension board];

activating a second music synthesizer of the tone color extension board to synthesize [and generate] second musical tones [using an extended tone color based on the sound pattern being reproduced] with expanded tone colors in accordance with the sound pattern respectively; and

mixing the first musical tones together with the second musical tones to produce mixed musical tones.

28. (Amended) A machine-readable media storing programs and data that cause a musical tone generation device installing a tone color extension board to perform a musical tone generation method comprising the steps of:

activating a first music synthesizer of the musical tone generation device to synthesize [and generate] first musical tones with [using] a prescribed tone color in response to key-operation information;

reproducing [an] arpeggio patterns [pattern] in response to the key-operation information on the tone color extension board;

activating a second music synthesizer of the tone color extension board to sequentially generate second musical tones with expanded tone colors in accordance with [using an extended tone color based on] the arpeggio patterns respectively [pattern being reproduced]; and

mixing the first musical tones together with the second musical tones to produce mixed musical tones.